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10/667,703	09/22/2003	Xing Li	D/A3035	9253

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DHINGRA, PAWANDEEP	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/667,703	LI ET AL.	
	Examiner	Art Unit	
	Pawandeep S. Dhingra	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 July 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 July 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- This action is responsive to the following communication: Amendment after non-final rejection filed on 07/05/2007.
- Claims 1-22 are pending in the present application.

Response to arguments

Applicant's arguments filed on 07/05/2007 with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

With respect to applicant's arguments on pages 13 regarding claim 1 that Karidi fails to disclose the outcome of the method is black and white images with improved quality.

In reply, Karidi discloses the outcome of the multi-scan system as shown in figure 2A-2B, step 56, is a current color, which can be just K or black. Furthermore, karidi also discloses in figure 1, step 10, that functional units such as color adjustment or color manipulation can be skipped by the user according to user's preference.

Applicant further argues that Karidi fails to disclose "exploiting the resources of said otherwise un-utilized output channels to provide image processing functions comprising filters, TRCs, halftoning modules, or rendering methods"

In reply, please see the discussion of claim 1 below.

Since Karidi in view of Tabata successfully discloses all the elements of claim 1, applicants arguments in regards to other references have been disregarded.

Drawing Objections

Previous drawing objections are withdrawn in view of applicant's amendments to the drawings, and submission of new drawings.

Claim Rejections - 35 USC § 112

Previous 112 objections to claims are withdrawn in view of applicant's amendments to the claims.

Examiner Notes

Examiner cites particular paragraphs, columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 4, 6, 8-9, 12, 14-15, 17, and 19-20 are rejected under 35 U.S.C. 103 as being unpatentable over Karidi et al., US 6,590,676 in view of Tabata et al., US 7, 190,486.

Re claim 1, Karidi discloses a method to improve quality of images of tag-based color imaging systems in a color image path (see abstract, and figure 2A-2B, note that after performing all the enhancements and smoothing techniques, it is apparent that the image quality is being improved) by exploiting resources of otherwise un-utilized channels (see column 2, lines 45-58; column 5, line 49-column 6, line 37; figures 1, 2A-2B, note that just the b/w image signal (i.e. K) as current color (CC) is sent alone as one of the cycle of multi-scan system, in which only current color - "K" signal gets processed utilizing all the resources of otherwise un-utilized RGB channels (note that each C,M,Y or K signal is processed in one cycle as current color, utilizing the resources of all the channels, the whole process takes 4 cycles, one cycle for each separation, and hence only signal C,M,Y, or K gets processed at any given time using all the three signals) for image processing and then the processed current color (K) signal comes out as one signal in step 56, fig. 2B), comprising: a) receiving data processed from an input image (see step 30 in figure 2A); b) receiving image analysis tags associated with the pixels of said input image data (see steps 31-34 in figure 2A; column 5, line 54-column 6, line 7); c) providing said tags to each channel (i.e. RGB channels) of ~~said~~ an image processing module to control image processing (see figures 2A-2B; column 1, line 64 – column 2, line 25), d) performing image processing on said input image data to provide a video signal output thereof (see figure 1, 2A, 2B; column 2, lines 61-63; column 1, lines 40-44;

column 3, lines 11-20, note that it is well known in the art and inherent from the disclosure of Karidi that the if the input is the video signal data (sequence of images), which is decompressed into RGB data (see step 19, figure 1), then the output must also be a video signal data (sequence of images) AND can further be uncompressed into video signal per se, if desired (see column 3, lines 31-32)); e) replicating said video output signal on ~~all~~ otherwise un-utilized output channels of said image processing module, thereby exploiting the resources of said otherwise un-utilized output channels to provide image processing functions comprising filters, TRCs, halftoning modules, or rendering methods; (see column 2, lines 45-58; column 4, line 19-column 6, line 37; figures 1, 2A-2B, note that just the b/w image signal, (the current color signal) (i.e. K = black) is sent alone and can be sent alone in case the image signal is a monochrome image signal as one of the cycle of multi-scan system, in which only "K" signal as current color signal gets processed utilizing all the resources of otherwise un-utilized RGB channels (note that usually each C,M,Y or K signal is processed in one cycle as current color (CC) utilizing the resources of all the three channels, the whole process takes 4 cycles, one cycle for each separation), but in this case since there is only K signal due to a monochrome image signal, the K signal will be processed as one cycle since only one signal - C, M, Y or K gets processed at one given time utilizing the resources of all the other un-utilized RGB channels (see steps 10-20 of figure which shows single scan but the same process exists for the multi-scan) thereby exploiting the resources of said otherwise un-utilized output channels to provide image processing functions comprising filters, TRCs, halftoning modules, or rendering methods (see

column 4, lines 19-column 6, line 37; figures 2A-2B) and then the processed K signal comes out as one signal in step 56, fig. 2B) of said image processing module (see steps 10- 20, figure 1); f) merging each video signal from each of said output channels based on the tags (see figures 2A-2B, column 5, line 49 - column 6, line 37, note that just the b/w image signal (instead of single C, M, Y or K) can be sent as the input signal for image processing and it comes out as one merged signal of current color (CC, which is just K signal) (see steps46-56, figure 2B) which is sent to the printer or memory); and g) outputting said merged video signal (see steps 20-23, figure 1; column 6, lines 35-37).

Karidi fails to disclose a method to improve quality of black and white images.

However, Tabata discloses a method and apparatus for improving quality of black and white images and converting the color image signal to a monochrome image signal (see abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the color conversion section as disclosed by Karidi to include the color conversion converting sections as taught by Tabata for the benefit of improving the quality of monochrome images (see abstract) and to utilize the converted monochrome signal as input for the image reconstruction path of Karidi for performing further enhancements to the monochrome image signal (K) as disclosed by Karidi.

Re claim 3, Karidi further discloses the received data processed from said input image is obtained from a memory (see memory 14, figure 1, column 3, lines 10-20).

Re claim 4, Karidi further discloses said tags are generated in an image analysis module (i.e. image reconstruction path, figure 1) (see also column 3, lines 34-37).

Re claim 6, Karidi further discloses said image processing includes filtering, Tonal Reproduction Curves or TRCs, and rendering based (see column 4, lines 19-column 5, line 38).

Re claim 8, Karidi further discloses said image processing comprises multiple resources to enhance image quality (see abstract, column 2, lines 9-25).

Re claim 9, Karidi further discloses additional channel modes (i.e. RGB) are utilized in a CMYK image path for processing in 3-channel color space (see figure 1, and 3B; column 6, line 66-column 7, line 12).

Re claim 12, Karidi discloses a system for improving quality of images of tag-based color imaging systems in a color image path (see abstract, and figure 2A-2B, note that after performing all the enhancements and smoothing techniques, it is apparent that the image quality is being improved) by exploiting resources of otherwise un-utilized channels (see column 2, lines 45-58; column 5, line 49-column 6, line 37; figures 1, 2A-2B, note that just the b/w image signal (i.e. K) as current color (CC) is sent alone as one of the cycle of multi-scan system, in which only current color - "K" signal gets processed utilizing all the resources of otherwise un-utilized RGB channels (note that each C,M,Y or K signal is processed in one cycle as current color, utilizing the resources of all the

channels, the whole process takes 4 cycles, one cycle for each separation, and hence only signal C,M,Y, or K gets processed at any given time using all the three signals) for image processing and then the processed current color (K) signal comes out as one signal in step 56, fig. 2B), comprising: at least one processor in communication with a storage device (see figure 1, note that image reconstruction path is the processor); sufficient software and hardware (see figure 1) to perform: a) receiving data processed from an input image (see step 30 in figure 2A); b) receiving image analysis tags associated with the pixels of said input image data (see steps 31-34 in figure 2A; column 5, line 54-column 6, line 7); c) providing said tags to each channel (i.e. RGB channels) of ~~said~~ an image processing module to control image processing (see figures 2A-2B; column 1, line 64 – column 2, line 25), d) performing image processing on said input image data to provide a video signal output thereof (see figure 1, 2A, 2B; column 2, lines 61-63; column 1, lines 40-44; column 3, lines 11-20, note that it is well known in the art and inherent from the disclosure of Karidi that the if the input is the video signal data (sequence of images), which is decompressed into RGB data (see step 19, figure 1), then the output must also be a video signal data (sequence of images) AND can further be uncompressed into video signal per se, if desired (see column 3, lines 31-32)); e) replicating said video output signal on ~~all~~ otherwise un-utilized output channels of said image processing module, thereby exploiting the resources of said otherwise un-utilized output channels to provide image processing functions comprising filters, TRCs, halftoning modules, or rendering methods; (see column 2, lines 45-58; column 4, line 19-column 6, line 37; figures 1, 2A-2B, note that just the b/w image signal, (the current

color signal) (i.e. K = black) is sent alone and can be sent alone in case the image signal is a monochrome image signal as one of the cycle of multi-scan system, in which only "K" signal as current color signal gets processed utilizing all the resources of otherwise un-utilized RGB channels (note that usually each C,M,Y or K signal is processed in one cycle as current color (CC) utilizing the resources of all the three channels, the whole process takes 4 cycles, one cycle for each separation), but in this case since there is only K signal due to a monochrome image signal, the K signal will be processed as one cycle since only one signal - C, M, Y or K gets processed at one given time utilizing the resources of all the other un-utilized RGB channels (see steps 10-20 of figure which shows single scan but the same process exists for the multi-scan) thereby exploiting the resources of said otherwise un-utilized output channels to provide image processing functions comprising filters, TRCs, halftoning modules, or rendering methods (see column 4, lines 19-column 6, line 37; figures 2A-2B) and then the processed K signal comes out as one signal in step 56, fig. 2B) of said image processing module (see steps 10- 20, figure 1); f) merging each video signal from each of said output channels based on the tags (see figures 2A-2B, column 5, line 49 - column 6, line 37, note that just the b/w image signal (instead of single C, M, Y or K) can be sent as the input signal for image processing and it comes out as one merged signal of current color (CC, which is just K signal) (see steps46-56, figure 2B) which is sent to the printer or memory); and g) outputting said merged video signal (see steps 20-23, figure 1; column 6, lines 35-37); and h) a device for rendering said merged video signal (see step 23, figure 1).

Karidi fails to disclose a method to improve quality of black and white images.

However, Tabata discloses a method and apparatus for improving quality of black and white images and converting the color image signal to a monochrome image signal (see abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the color conversion section as disclosed by Karidi to include the color conversion converting sections as taught by Tabata for the benefit of improving the quality of monochrome images (see abstract) and to utilize the converted monochrome signal as input for the image reconstruction path of Karidi for performing further enhancements to the monochrome image signal (K) as disclosed by Karidi.

Re Claim 14, claim 14 recites identical features, as claim 3, except claim 14 is a system claim. Thus, arguments made for claim 3 are applicable for claim 14.

Re Claim 15, claim 15 recites identical features, as claim 4, except claim 15 is a system claim. Thus, arguments made for claim 4 are applicable for claim 15.

Re Claim 17, claim 17 recites identical features, as claim 6, except claim 17 is a system claim. Thus, arguments made for claim 6 are applicable for claim 17.

Re Claim 19, claim 19 recites identical features, as claim 8, except claim 19 is a system claim. Thus, arguments made for claim 8 are applicable for claim 19.

Re Claim 20, claim 20 recites identical features, as claim 9, except claim 20 is a system claim. Thus, arguments made for claim 9 are applicable for claim 20.

3. Claims 2, 11, 13, and 22 are rejected under 35 U.S.C. 103 as being unpatentable over Karidi et al., US 6,590,676 in view of Tabata et al., US 7, 190,486 further in view of Schweid et al., US 6,535,633.

Re claim 2, Karidi does not disclose the tags ~~are determined from one or more~~ indicate at least one characteristics of the image that are determined through segmentation.

However, Schweid et al. discloses the tags indicate at least one characteristics of the image that are determined through segmentation (see column 2, lines 12-32; column 5, lines 13-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the image reconstruction architecture as disclosed by Karidi include the color conversion converting sections as taught by Tabata for the benefit of improving the quality of monochrome images (see abstract) and to utilize the converted monochrome signal as input for the image reconstruction path of Karidi for performing further enhancements to the monochrome image signal (K) as disclosed by Karidi, and to include the method for classifying image pixels based on segmentation as taught by Schweid for the benefit of having *"an accurate and efficient segmentation of input image pixels into classes"* as taught by Schweid at column 4, lines 11-12.

Re claim 11, Karidi fails to disclose additional channel modes are utilized in a color image path for processing in 1-channel Black and White mode.

However, Schweid additional channel modes are utilized in a color image path for processing in 1-channel Black and White mode (see column 3, lines 38-47).

Re Claim 13, claim 13 recites identical features, as claim 2, except claim 13 is a system claim. Thus, arguments made for claim 2 are applicable for claim 13.

Re Claim 22, claim 22 recites identical features, as claim 11, except claim 22 is a system claim. Thus, arguments made for claim 11 are applicable for claim 22.

4. Claims 5, 10, 16, and 21 are rejected under 35 U.S.C. 103 as being unpatentable over Karidi et al., US 6,590,676 in view of Tabata et al., US 7, 190,486 further in view of Tse, US 5,572,599.

Re claim 5, Karidi does not explicitly disclose said tags describe for each pixel its classification (e.g., continuous tone, low frequency halftone, high frequency halftone, text, etc) (see steps 40-43 in figure 2A; column 5, line 66-column 6, line 11).

However, Tse also discloses said tags describe for each pixel its classification (e.g., continuous tone, low frequency halftone, high frequency halftone, text, etc) (see column 8, lines 15-17).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the image reconstruction architecture as disclosed by Karidi

to include the color conversion converting sections as taught by Tabata for the benefit of improving the quality of monochrome images (see abstract) and to utilize the converted monochrome signal as input for the image reconstruction path of Karidi for performing further enhancements to the monochrome image signal (K) as disclosed by Karidi, and to include the method for describe for each pixel its classification based on tags as taught by Tse for the benefit of having *"image processing system for a monochrome printing system which is capable of scaling to include color functions without redesigning the system's architecture"* as taught by Tse at column 1, lines 8-13.

Re claim 10, Karidi fails to disclose a 4th channel provides resources for the luminance channel.

However, Tse discloses a 4th channel (i.e. extra channel) provides resources for the luminance channel (see column 6, lines 30-50).

Re Claim 16, claim 16 recites identical features, as claim 5, except claim 16 is a system claim. Thus, arguments made for claim 5 are applicable for claim 16.

Re Claim 21, claim 21 recites identical features, as claim 10, except claim 21 is a system claim. Thus, arguments made for claim 10 are applicable for claim 21.

5. Claims 7 & 18 are rejected under 35 U.S.C. 103 as being unpatentable over Karidi et al., US 6,590,676 in view of Tabata et al., US 7, 190,486 further in view of Kawano, US 6,897,983.

Re claims 7, Karidi further discloses de-screen filters (low-pass filters) and enhancement filters (i.e. text enhancement functional unit 50, see figure 2B) are applied to the image based on pixel classification (i.e. classification tags) (see column, lines 19-48, and figure 2A).

Karidi fails to disclose different de-screen filters with ~~various~~ cut-off frequencies

However, Kawano discloses different de-screen filters (i.e. low-pass filters, band-banded cut filters) with ~~various~~ cut-off frequencies for smoothing the images (see column 1, lines 40-63).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the image reconstruction architecture as disclosed by Karidi to include the color conversion converting sections as taught by Tabata for the benefit of improving the quality of monochrome images (see abstract) and to utilize the converted monochrome signal as input for the image reconstruction path of Karidi for performing further enhancements to the monochrome image signal (K) as disclosed by Karidi, and to include the image processor as taught by Kawano for the benefit of *"effectively suppressing moire appearance and an image processor which provides a simple edge emphasizing process for effectively emphasizing edges"* as taught by Kawano at column 3, lines 61-65.

Re Claim 18, claim 18 recites identical features, as claim 7, except claim 18 is a system claim. Thus, arguments made for claim 7 are applicable for claim 18.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, The application described figure 1 as prior art, which reads on the majority of dependent claims.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pawandeep S. Dhingra whose telephone number is 571-270-1231. The examiner can normally be reached on M-F, 9:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler Lamb can be reached on 571-272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TWYLER LAMB
SUPERVISORY PATENT EXAMINER

Pd
September 16, 2007